

A taxonomic study of the genus *Coptacra* Stål, 1873 (Orthoptera: Acridoidea: Catantopidae) from China with description of one new species

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Abstract: This paper deals with a taxonomic study of *Coptacra* Stål, 1873 from China, with a description of a new species *Coptacra xiai* sp. nov. The new species is similar to *C. yunnanensis* Zhang et Yin, 2002, but the frontal ridge contracted under median ocellus; vertical diameter of eye 2.2 times its horizontal diameter; median vein area of tegmen wider than cubital area; upper ovipositor valves narrow, long and smooth. A key to the known species of the genus *Coptacra* from China is given. The type specimens are deposited in the Museum of Hebei University (MHU), China.

Key words: Orthoptera; Acridoidea; Catantopidae; *Coptacra*; new species; China

The genus *Coptacra* was erected by Stål in 1873. It is very similar to *Ecphymacris* Bi, 1984, but it differs from the latter in: cross veins vertical with longitudinal veins on the apical part of tegmen; pronotum without thick granules; antennae slender, far extending beyond the posterior margin of pronotum; prosternal process pointed at apex. We agree with the view point of Bi (1984), that the genus *Ecphymacris* is valid and its type species is *Ecphymacris lofoashana* (Tinkham, 1940) = *Coptacra lofoashana* Tinkham, 1940 (Type locality: Lofoshan, Guangdong, China). We also agree with the view point of Li et al. (2006), that the species *Coptacra tuberculata* Ramme, 1941 (Type locality: Lofoshan, Guangdong, China) is a synonym of *Ecphymacris lofoashana* (Tinkham, 1940).

In the present paper, a taxonomic study of the genus *Coptacra* Stål, 1873 from China is given, including eight species, with the description of a new species from Yunnan, China. A key to the known species of the genus *Coptacra* from China is given.

The type specimens are deposited in the Museum of Hebei University (MHU), China.

Genus *Coptacra* Stål, 1873

Coptacra Stål, 1873, Recensio Orthopterorum. Revue critique des Orthoptères décrits par Linné, De Geer et Thunberg

1 Acridioidea: 37, 58; Brunner, 1893, *Ann. Mus. Civ. Stor. Nat. Genova Ser. 2*, 13: 143; Tinkham, 1940, *Lingnan Sci. J., Canton*, 19(3): 323, 325; Willemse, 1957, *Publ. natuurhist. Genootsch. Limburg*, 10: 445; Kevan, 1966, *Ent. Meddr.*, 34: 407; Liu et al., 1995, Studies on Acridoids of Hainan Island, 71–72; Hazra et al., 1995, State Fauna Series 4 Fauna of Meghalaya, 3: 254; Jiang et al., 1998, Grasshoppers and Locusts from Guangxi, 157; Zhang et al., 2002, *Acta Zootaxonomica Sin.*, 27(2): 262; Li et al., 2006, *Fauna Sinica, Insecta*, 43: 537.

Type species: *Coptacra foedata* (Serville, 1838) = *Acridium foedatum* Serville, 1838.

Body relatively large. Frontal ridge not projected between antennae in profile and not expended between antennae, frons almost straight. Antennae of male slender, usually far extending beyond the posterior margin of pronotum. Pronotum relatively smooth on dorsum, without thick granules. Median carina of pronotum lower, distinctly cut by three sulci. Lateral lobes of pronotum unicolour at posterior-lower angle, without light band. Prosternal process relatively thickened at base, pointed apically. Tegmina obliquely truncated at apex. Cross veins vertical with longitudinal veins on apical part of tegmina. Hind femur usually without dark band on outer side. Posterior margin of 10th abdominal tergite of male with small furcula. Cerci of male longer, apex relatively curved downward, apex slightly acute.

This genus has been recorded with 14 species

基金项目: 国家自然科学基金项目(30770263); 中国科学院基金项目(KSCX2-YW-Z)

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收稿日期 Received: 2010-06-24; 接受日期 Accepted: 2010-10-28

(Serville, 1839; Walker, 1870; Bolívar, 1902; Rehn, 1902; Willemse, 1939; Tinkham, 1940; Ramme, 1941; Bei-Bienko, 1968; Balderson *et al.*, 1987; Yin *et al.*, 1996; Zhang *et al.*, 2002; Wei *et al.*, 2005; Eades *et al.*, 2009)

distributed in Costa Rica, Japan, Indonesia, Malaya, Viet Nam, Cambodia, Burma, India, Nepal and China, among which 8 species are found in China (including a new species).

Key to the species of *Coptacra* Stål, 1873 from China

- 1 Frons slightly concave inward at the middle in profile view 2
- Frons relatively straight, not concave inward at the middle in profile view 3
- 2 Antennae all brown; inner side of hind femur red, tegmina extending over the apex of hind femur slightly *C. hainanensis* Tinkham, 1940
- Antennae brown, apical four segments yellowish; inner side of hind femur black, tegmina reaching far behind the apex of hind femur *C. nigrifemura* Wei *et al.*, 2005
- 3 Body smaller and robust, median carina of pronotum relatively elevated, surface of vertex relatively depressed 4
- Body larger and slender, median carina of pronotum relatively low, surface of vertex flat and not depressed 5
- 4 Body slightly larger, median carina of pronotum distinctly elevated. Head larger, vertex distinctly elevated *C. formosana* Tinkham, 1940
- Body slightly smaller, median carina of pronotum flatter. Head smaller, vertex not distinctly elevated *C. foedata* (Serville, 1838)
- 5 Metazona equal to prozona in length. Fore transverse sulcus of pronotum only slightly cut median carina. Frons making nearly rectangle with vertex *C. tonkinensis* Willemse, 1939
- Metazona longer prozona. Fore transverse sulcus of pronotum deeply cut median carina. Frons slightly sloping backward, making acute angle with vertex 6
- 6 Length of tegmen 3.8 times that of pronotum, apex of tegmen rounded, without a distinct oblique truncation *C. taiwanensis* Zhang *et al.*, 2002
- Length of tegmen 4 times that of pronotum, apex of tegmen with a distinct oblique truncation 7
- 7 Frontal ridge parallel. Vertical diameter of eye 1.8 times its horizontal diameter. Medial area of tegmen equal to cubital area in width. Upper ovipositor valves short and wide at base, with smaller teeth *C. yunnanensis* Zhang *et al.*, 2002
- Frontal ridge contracted in the middle. Vertical diameter of eye 2.2 times its horizontal diameter. Medial area of tegmen wider than cubital area. Upper ovipositor valves narrow and long, smooth *C. xiai* sp. nov.

1 *Coptacra hainanensis* Tinkham, 1940

Coptacra hainanensis Tinkham, 1940, *Lingnan Sci. J.*, Canton, 19(3): 325; Yin, 1979, *Acta Zootaxonomica Sin.*, 4(1): 27; Liu *et al.*, 1995, Studies on Acridoids of Hainan Island: 72, 139; Li *et al.*, 2006, Fauna Sinica, Insecta, 43: 540.

Measurements: Length of body: ♂ 21.0 – 23.0 mm, ♀ 33.0 mm. Length of pronotum: ♂ 5.3 – 5.9 mm, ♀ 7.3 mm. Length of tegmina: ♂ 22.5 – 24.0 mm, ♀ 31.5 mm. Length of hind femur: ♂ 15.0 – 17.0 mm, ♀ 19.0 mm.

Distribution: China (Hainan, Guangdong, Guizhou).

Location of type: International Concrete Repair Institute (ICRI) Zhongshan (Holotype female) and Shanghai Natural Museum (Allotype male).

2 *Coptacra nigrifemura* Wei *et al.*, 2005

Coptacra nigrifemura Wei *et al.*, 2005, *Acta Zootaxonomica Sin.*, 30(2): 369[373].

Distribution: China (Guangxi, Yizhou).

Measurements: Length of body: ♀ 32.0 – 33.0 mm. Length of tegmina: ♀ 29.0 – 30.0 mm. Length of hind femur: ♀ 18.0 – 19.0 mm.

Location of type: Institute of Zoology, Shaanxi Normal University (Holotype female and paratype female) and male unknown.

3 *Coptacra formosana* Tinkham, 1940

Coptacra formosana Tinkham, 1940, *Lingnan Sci. J.*,

Canton, 19(3): 323; Li *et al.*, 2006, Fauna Sinica, Insecta, 43: 543.

Measurements: Without description in the original paper of Tinkham, 1940 and the fauna of Li *et al.* (2006).

Distribution: China (Taiwan).

Location of type: Unknown.

4 *Coptacra foedata* (Serville, 1838)

Coptacra foedata (Serville, 1838) Stål, 1873, Recensio Orthopterorum. Revue critique des Orthoptères décrits par Linné, De Geer *et* Thunberg 1 Acridioidea: 58; Rehn, 1902, *Proc. Acad. Nat. Sci. Philad.*, 54: 636; Kirby, 1910, A Synonymic Catalogue Orth. III: 467; Willemse, 1957, *Publ. natuurhist. Genootsch. Limburg*, 10: 448; Kevan, 1966, *Ent. Meddr.*, 34: 407; Mishchenko and Storozhenko, 1990, In: Gorochov ed. News of Systematics and Faunistics of Vietnam Insects Part 1. Trudy Zool. Inst., Akad. Nauk SSSR, Leningrad, 209: 29; Li *et al.*, 2006, Fauna Sinica, Insecta, 43: 543.

Acridium faedatum Serville, 1838, *Ins. Orth.*, p. 662. n. 23.

Measurements: Length of body: ♂ 19.0 mm, ♀ 27.0 – 29.0 mm. Length of pronotum: ♂ 4.0 – 5.0 mm, ♀ 7.0 – 8.0 mm. Length of tegmina: ♂ 18.0 mm, ♀ 24.0 – 25.0 mm. Length of hind femur: ♂ 12.0 mm, ♀ 16.0 – 17.0 mm.

Distribution: China (Guangdong, Hong Kong, Taiwan); Japan, Vietnam, Cambodia, Indonesia (Java), Malaya, Burma.

Kind of type: Unspecified primary type.

5 *Coptacra tonkinensis* Willemse, 1939

Coptacra tonkinensis Willemse, 1939, *Entomol. Ber.* (Amsterdam), 10 (229): 165; Willemse, 1957, *Publ. natuurhist. Genootsch. Limburg*, 10: 447; Liu *et al.*, 1995, *Studies on Acridoids of Hainan Island*: 72, 140; Zhang *et al.*, 2002, *Acta Zootaxonomica Sin.*, 27(2): 261; Li *et al.*, 2006, *Fauna Sinica, Insecta*, 43: 541.

Measurements: Length of body: ♂ 24.5 – 25.5 mm, ♀ 35.0 mm. Length of pronotum: ♂ 5.4 – 5.8 mm, ♀ 8.0 mm. Length of tegmina: ♂ 22.5 – 24.0 mm, ♀ 30.0 mm. Length of hind femur: ♂ 13.8 – 14.5 mm, ♀ 18.5 mm.

Distribution: China (Yunnan, Guangxi); Indo-China, Viet Nam, Tonkin.

Location of type: New Hampshire Retirement System (NHRS) Stockholm (Holotype female).

6 *Coptacra taiwanensis* Zhang *et al.*, 2002

Coptacra taiwanensis Zhang *et al.*, 2002, *Acta Zootaxonomica Sin.* 27(2): 263.

Measurements: Length of body: ♂ 22.1 mm, ♀ 32.2 mm. Length of pronotum: ♂ 5.1 mm, ♀ 7.3 mm. Length of tegmina: ♂ 18.2 mm, ♀ 28.5 mm. Length of hind femur: ♂ 13.4 mm, ♀ 18.2 mm.

Distribution: China (Taiwan).

Location of type: Museum of Hebei University (Holotype male and paratype female).

7 *Coptacra yunnanensis* Zhang *et al.*, 2002

Coptacra yunnanensis Zhang *et al.*, 2002, *Acta Zootaxonomica Sin.*, 27(2): 264.

Measurements: Length of body: ♀ 32.1 mm. Length of pronotum: ♀ 7.3 mm. Length of tegmina: ♀ 30.4 mm. Length of hind femur: ♀ 18.1 mm.

Distribution: China (♀ Yunnan, ♂ unknown).

Location of type: Museum of Hebei University, MHU (Holotype female).

8 *Coptacra xiai* sp. nov. (Fig. 1)

Type materials: Holotype ♀, China: Xishuangbanna, Yunnan province, 21°08'N, 99°56'E, 22-August-2009, leg. YE Bao-Hua and CAI Long-Jian (MHU). Paratypes: 4 ♂♂, 1 ♀, with same data as holotype.

Descriptions: Female (Fig. 1: B – F). Body relatively large. Head short and high, shorter than pronotum. Frons nearly oblong in frontal view, slightly sloping backward, in lateral view making acute angle with vertex. Frontal ridge contracted under median ocellus. Eyes long oval, longitudinal diameter about 2.2 times as long as horizontal diameter. Antennae filiform, 26 segmented, extending far beyond the posterior margin of pronotum, length of a middle segment 3 times as long as width. Median carina of pronotum low, lateral

carinae absent, the length of metazona about 1.3 times as long as that of prozona, anterior margin straight, posterior margin angulated. Prosternal process conical, apex pointed. Interspace of mesosternal lobes nearly tetragonal, length as long as 1.2 times width. Tegmina extending far beyond the end of hind femur, cross veins vertical with longitudinal veins and with a distinct oblique truncation at apical part, medial vein area wider than cubital area. Hind femur slender, length about 5 times as long as width, upper median keel of hind femur serrated, tip of lower lateral genicular lobe rounded. Hind tibiae with 10 spines on inner side and 9 spines on outer side, outer apical spine absent. Arolium larger, extending over the middle of claw. Tympanal organ developed. Epiproct long, with a median longitudinal broad sulcus in full length. Subgenital plate oblong, posterior margin with angulated projection in the middle. Cercus conical, not reaching the end of epiproct. Ovipositor valves narrow and long, hooked at apex, outer margin of valves smooth.

Male (Fig. 1: A). Body smaller than female in size. Eyes long oval, longitudinal diameter about 2.0 times as long as horizontal diameter. The length of prozona about 1.4 times as long as that of metazoan. Length of interspace of mesosternal lobes about 1.25 times its width. Cercus conical, curved inward. Subgenital plate short, extending over the end of epiproct slightly, apex rounded.

Coloration. Body dark brown. Eyes brown. Antennae reddish-brown. Tegmina dark brown. Hind femur yellowish-brown on outer and upper sides, with three dark bands on upper side, basal side dark, inner side red, inner genicular lobe red. Hind tibiae red, spines on upper sides red, apex of spine black. Hind tarsi red.

Measurements: Length of body: ♂ 19.7 – 22.1 mm, ♀ 32.9 – 33.2 mm. Length of pronotum: ♂ 5.2 – 5.9 mm, ♀ 7.9 – 8.1 mm. Length of tegmina: ♂ 20.7 – 23.6 mm, ♀ 31.5 – 32.3 mm. Length of hind femur: ♂ 13.5 – 14.8 mm, ♀ 18.8 – 19.0 mm.

Diagnosis: The new species is similar to *C. yunnanensis* Zhang *et al.*, 2002, but it differs from the latter in four characters (Table 1).

Etymology: The specific epithet is derived from the last name of Prof. XIA Kai-Ling for his contribution to entomology.

ACKNOWLEDGEMENTS This study is financially supported by the grants of National Natural Sciences Foundation of China (No. 30770263) and the Chinese Academy of Sciences (No. KSCX2-YW-Z). We are grateful to Mr. CAI Long-Jian for collecting the type specimens.

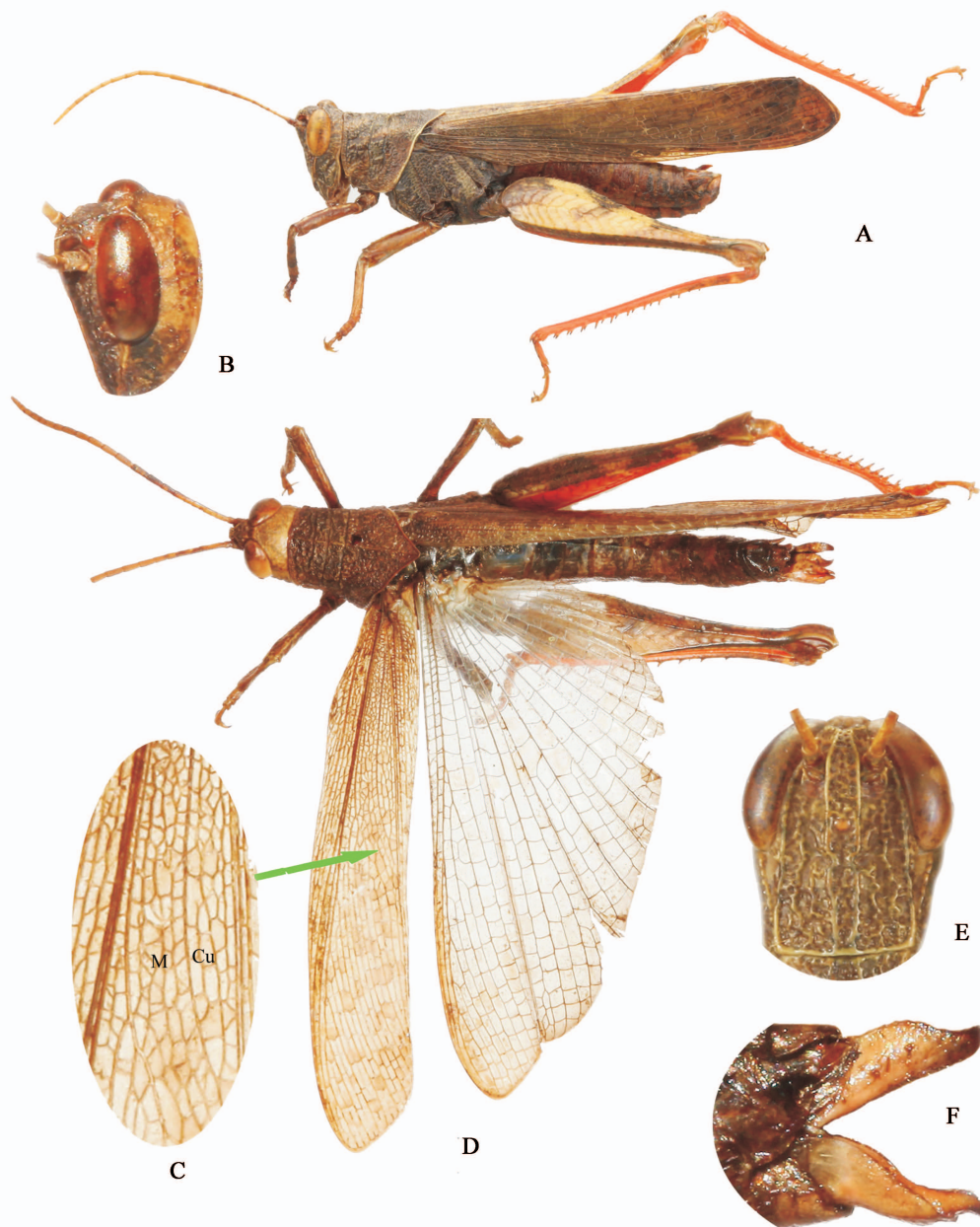


Fig. 1 Photographs of *Coptacra xiai* sp. nov.

A: Male, lateral view; B: Female, head lateral view; C: Female, medial vein (M) area and cubital (Cu) area; D: Female, dorsal view; E: Female, head frontal view; F: Ovipositor valves.

Table 1 Comparison of *Coptacra xiai* sp. nov. and *C. yunnanensis* Zhang et Yin, 2002

	<i>Coptacra xiai</i> sp. nov.	<i>C. yunnanensis</i> Zhang et Yin, 2002
Frontal ridge	Contracted under median ocellus	Parallel on both sides
Eyes	Vertical diameter 2.2 times horizontal diameter	Vertical diameter 1.8 times horizontal diameter
Tegmina	Medial vein area wider than cubital area in width	Medial vein area equal to cubital area in width
Ovipositor valves	Upper valves narrow and long, smooth.	Upper valves short and wide at base, with smaller teeth

Only females are compared, since the male of *C. yunnanensis* Zhang et Yin, 2002 is unknown.

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中国切翅蝗属分类研究及一新种记述 (直翅目: 蝗总科: 斑腿蝗科)

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摘要: 本文对中国切翅蝗属 *Coptacra* Stål, 1873 进行了系统的分类研究, 附一新种记述, 即夏氏切翅蝗 *Coptacra xiai* sp. nov. (图 1: A~F)。新种同云南切翅蝗 *C. yunnanensis* Zhang et Yin, 2002 近似, 不同之处为颜面隆起在中部收缩, 复眼纵径为横径的 2.2 倍, 前翅中脉域宽于肘脉域, 产卵瓣细长, 光滑。文中并给出该属中国所有已知种的检索表。模式标本保存于河北大学博物馆(MHU)。

关键词: 直翅目; 蝗总科; 斑腿蝗科; 切翅蝗属; 新种; 中国

中图分类号: Q969 **文献标识码:** A **文章编号:** 0454-6296(2011)02-0179-05

附录: 新种简记

夏氏切翅蝗, 新种 *Coptacra xiai* sp. nov. (图 1: A~F)

体长: ♂ 19.7~22.1 mm, ♀ 32.9~33.2 mm。前胸背板长: ♂ 5.2~5.9 mm, ♀ 7.9~8.1 mm。前翅长: ♂ 20.7~23.6 mm, ♀ 31.5~32.3 mm。后足股节长: ♂ 13.5~14.8 mm, ♀ 18.8~19.0 mm。

正模 ♀, 副模 4 ♂♂, 1 ♀, 云南, 西双版纳, 21°08'N, 99°56'E, 22-8-2009, 叶保华、蔡龙建采。

词源: 新种以夏凯龄教授的姓为名, 对他在昆虫学上的突出贡献表示敬意!

(责任编辑: 袁德成)